HISTORY

COLLEGE OF MEDICINE

1959-1968

CHAPTER 12

DEPARTMENT OF PATHOLOGY

Emmerich von Haam

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I INTRODUCTION

In the first volume of the history of the College of Medicine of The Ohio State University, covering the years 1834-1934, we find that "Special Pathology" at the Willoughby Medical College of Columbus was first taught in the department of the "Practice of Medicine" under the guidance of Professor John Butterfield. Later, however, pathology was taught in the Department of Materia Medica under Professor T. R. Spencer. At the same time, in the Starling Medical College, this subject was taught in the Department of Anatomy by numerous instructors in pathologic anatomy and in the Department of Physiology and Pathology by instructors in histology. In the Columbus Medical College, organized in 1876 by Drs. D. N. Kinsman and J. W. Hamilton, pathology also was split into pathologic anatomy and pathologic histology and was taught by instructors in different departments. When the Ohio Medical University was organized in 1892, Dr. George M. Waters lectured on general pathology as adjunct in the department of the "Principles and Practice of Medicine" until he became Dean in 1896, while Dr. Ernest Scott started as a young instructor in surgical pathology in 1904. After the merger of the Starling Medical College and the Ohio Medical University in 1907, Ernest Scott became Professor of Pathology and remained head of the Department of Pathology after the college merged with The Ohio State University in 1914 until his death in 1934. During this time Dr. Scott built a strong department with Dr. Carl L. Spohr as an additional professor, two assistant professors, and numerous instructors and student assistants. For a short time the Department also had the responsibility for teaching bacteriology until an independent Department of Bacteriology was organized under the

leadership of Dr. Charles Morrey. The Department of Pathology moved to the new campus, where it occupied the third floor of Hamilton Hall and also directed the clinical laboratories at the new University Hospital as well as laboratories of St. Francis Hospital, Columbus State Hospital, and Children's Hospital.

After a short interim following the death of Dr. Scott, during which Dr. Spohr acted as chairman of the Department, Dr. Emmerich von Haam in 1937 became the second full-time Professor and Chairman of the Department. Under his guidance—and we quote from Vol. II of the "History of the College of Medicine, 1934-1958" written by Paul N. Hudson in 1961—"The departmental staff was molded into a cooperatively functioning unit. Teaching was strengthened by the acquisition of additional members, the morale was improved and the experimental aspects of pathology introduced."

The greatest period of departmental development and expansion occurred between the years 1948 and 1958 when the Department moved to larger quarters in Starling Loving Hospital and the professional staff increased from 15 to 40, with a marked increase in the teaching and service loads.

II TEACHING PROGRAM

In 1958 the Department of Pathology of The Ohio State University was composed of 13 divisions, each headed by a Board-qualified specialist of professorial rank. These divisions provided laboratory services for the University Hospital and its affiliated hospitals; they taught pathology and clinical pathology to graduate and undergraduate students in medicine and allied medical sciences and trained residents in pathology, and engaged actively in medical research. Teaching was always considered the most

important function of the Department, and the past ten years have seen some drastic changes in the teaching activities, commensurate with the drastic changes in the teaching curriculum of the College of Medicine.

A. For Professional and Undergraduate Students. Undergraduate teaching of medical students up to 1965 consisted of courses in pathology and clinical pathology given to second, third, and fourth year students. Second year students were taught in a combined lecture and laboratory continuation course of 15 credit hours covering the entire field of general and special pathology and extending through the autumn, winter, and spring quarters. Most of the staff of the Department participated in this course. The laboratory studies consisted of demonstrations in gross pathology by preserved and fresh specimens and lantern slides and a detailed study of approximately 300 microscopic slides, under the guidance of instructors in the Department. Laboratory instruction was handled in groups not exceeding 30 students. Clinical pathology was taught to second year students during the winter and spring quarters by the clinical laboratory staff of the Department and consisted of two lectures and one three-hour laboratory period each week covering the more important aspects of medical bacteriology, immunology, biochemistry, hematology, and the examination of tissue fluids.

Third year students were instructed in autopsy technique; each student was expected to attend a minimum of ten autopsies. In this course the correlation of the patient's symptoms, the clinical findings, the laboratory findings and the clinical diagnosis with the anatomic findings at the autopsy table was emphasized. Fourth year students were expected to attend weekly clinicopathological conferences conducted by a staff member from the Department of Pathology and one from the various clinical departments

of the College of Medicine. At each conference an interesting case was discussed in detail by the member from the clinical staff, who tried to reach a clinical diagnosis on the basis of the presented data. The pathologist then presented the autopsy findings. This was followed by a lively question and discussion period in which the entire audience participated. The students had received the clinical history a week previously and had had opportunity to formulate their own opinions, which then were discussed at the conference. The total number of clock hours spent in teaching these courses was approximately 1250 hours per year.

The years following 1958 saw many changes in our teaching program for medical students, which were instituted in part by the chairman of the Department upon the recommendation of the faculty of the Department and partly were made necessary by changes made in the general medical curriculum upon the recommendation of the Curriculum Committee of the College of Medicine.

In the course of pathology offered to second year medical students a new technique of tutorial exercise was introduced in 1960. Multiple organs from one single case which showed the gross alterations resulting from one basic disease process and its complications were studied. The students were required both to make a gross diagnosis of each affected organ system and to describe and discuss the pathogenesis of the disease from its inception to its fatal termination. The students were encouraged to correlate the abnormal physiology in basic anatomical, biochemical, and physiological terms and concepts. In 1962 the Department decided to provide the second year medical students not only with the morphological aspects of pathology but to correlate those aspects with the clinical implications of the disease processes. In gross demonstrations in the winter and spring quarters the students were required to reconstruct the pathogenesis of a case and to

arrive at a diagnosis by utilizing both clinical and pathological data. Very frequently, selected diagnostic x-rays and clinical laboratory data were employed. It was hoped that by this approach students would think of a disease process as the synthesis of a basic pathologic process with its clinical and laboratory manifestations. The rapid progress in the field of medicine with its emphasis on the physiology of disease required that pathology be approached as from a process of altered physiology rather than from a static science of disease.

When the teaching of microbiology for medical students was moved from the College of Arts and Sciences to the College of Medicine on July 1, 1964, a division of microbiology was established in the Department of Pathology. Its first task was to prepare the facilities needed to support laboratory instruction and to obtain the equipment and materials required for the course in medical microbiology. As given in 1964, this course completed a two quarter sequence started in the preceding spring quarter. During this year revisions were made to allow the total course to be conducted during the autumn quarter of the 1965-66 school year in accordance with the changes made in the medical curriculum. This necessitated a complete revision of the laboratory manual and the publication of a new one. This course was taught in close correlation with that in general pathology. A separate Department of Medical Microbiology was established in 1966 and courses given by that department remained closely correlated with the work in the general pathology of infectious diseases given by the Department of Pathology.

The profound changes made in the curriculum of the College of Medicine in 1964 had their effect on the teaching activities of the Department of Pathology. The main course in general and special pathology was given during two quarters instead of three, making it necessary for the students

to receive daily instruction in the Department. This proved not only a great hardship for the staff of the Department, which had to abandon research activities during this period and to neglect its service functions, but also proved very difficult for the students. Therefore, on the recommendation of the chairman, the teaching schedule in pathology in the following year was again extended over three quarters.

On July 1, 1967 Dr. von Haam retired as chairman of the Department and Dr. Jack C. Geer, formerly professor of pathology at the University of Texas' South Texas Medical School, became chairman. Upon his recommendation the course of instruction in general and special pathology for second year medical students was entirely revised. The revision was aimed primarily toward emphasizing an understanding of the pathogenesis of disease in man. To this end the presentation of general pathology was considerably shortened; the language of disease was emphasized, and the number of examples presented was sharply limited. Special and clinical pathology were presented together and the instructional time increased from that of previous years. The method of laboratory instruction was modified by the substitution of problem-solving experiences for drills in histopathology. Histopathology exercises were provided only during the first ten weeks of the course. Laboratory presentations were of gross specimens, Kodachromes, clinicopathological conferences, and case discussions. Active participation by the students in these presentations was emphasized.

The formal course in general and special pathology was completed at the end of the winter quarter. Instructional time in the spring quarter was devoted to elective experiences. Approximately one-half of the class elected one or two of the following laboratory experiences: autopsy pathology, surgical pathology, neuropathology, pediatric pathology, clinical chemistry,

clinical microbiology, blood banking, and hematology. In addition to these laboratories in University Hospital, groups of students were assigned to laboratories of Riverside Methodist, Mt. Carmel, and Grant hospitals. The purpose of these laboratory experiences was to allow the student opportunity to use his knowledge of pathology. These elective studies were well received by both faculty and students and were continued.

The teaching of clinical pathology also underwent profound changes during this period. An attempt was made to effect a close correlation with the course in general pathology and to serve this purpose certain phases of clinical pathology were taught at the end of the autumn quarter while the principal teaching activities were concentrated in the winter quarter. Teaching of clinical pathology during the spring quarter was discontinued. Though the combination of anatomical and clinical pathology teaching was successful, it had to be discontinued because of conflicts with graduate instruction. It was hoped that in the future this conflict could be eliminated by establishing separate courses for medical and graduate students.

One of the chief purposes in the modification of the medical curriculum was to shorten didactic periods in order to allow more time for study and to permit all four medical classes to participate in elective courses. Senior faculty members of the Department of Pathology offered individual studies in pathology which were open to third and fourth year medical students and to graduate students. The periods of study varied from one to four months and during that period the student was expected to spend most of the day in the assigned laboratory and to complement his studies with appropriate reading assignments in the library. The following subjects were offered:

Pathologic Anatomy
Principles of Clinical Cytology
Serum Enzymes for Diagnosis of Disease
Clinical Chemistry
Neuropathology
Immunohematology
Clinical Microbiology
Pediatric Pathology
Special Pulmonary Pathology
Ultrastructure of Cells in Disease
Laboratory Medicine—the Erythrocyte
Problems in Pathology and Clinical Pathology

Senior members of the Department also offered special lecture courses in pathology given in turn, one in each quarter of the academic year and each carrying three hours of credit. The subjects of these elective lecture courses were:

Blood and Bone Marrow
Biochemistry of Metabolic Disease
Surgical Pathology
Neuropathology
Immunohematology
Exfoliative Cytology
Neoplasms of Children
Cellular Pathology

The response to these elective lectures was gratifying indeed; they were always much in demand by residents and graduate students.

The same reforms also brought a halt to all required instruction to third and fourth year medical students. Required attendance at autopsies by third year students was discontinued and autopsy techniques constituted only an elective study. The weekly clinicopathological conference at University Hospital was first reduced to one a month and then discontinued except for an occasional conference held for a visiting professor. It was the feeling of the cooperating departments that this form of instruction in a medical center was no longer of value. A medical death conference was substituted which allowed discussion of more cases and more active participation by students and house staff. It was the aim of the Department of

Pathology to participate in a large number of clinical conferences attended by students and house staff to demonstrate effectively the role of the pathologist in the practice of medicine and to continue the teaching of pathology throughout the years of clinical instruction.

The Department of Pathology also had the responsibility for teaching general pathology and selected subjects of special pathology to second year students of the College of Dentistry. This course consisted of lectures and laboratory work in which degeneration, inflammation, infectious diseases, and neoplasia were emphasized. In addition the dental students received instruction in heart disease, blood dyscrasias, and metabolic disorders. The class enrollment was approximately 150. The principles of pathology were also taught to students in their second year of Optometry and to students of the School of Nursing, who received a short course on "Introduction to Disease."

The instruction of dental students saw little change. However, the course to optometry students was increased in scope and length upon the request of the director of the School of Optometry and was made equal to the course given to dental students. The School of Nursing discontinued the introductory course in pathology required of second year nursing students and replaced it by individual lectures on important medical problems, such as heart disease and cancer, which were given by members of the Department within the framework of a regular introductory medical course.

One of the principal responsibilities in the teaching program for non-medical students was the training of medical technologists. In 1945 a training schedule, worked out with the College of Arts and Sciences, was inaugurated. This program led eventually to a school of medical technology approved by the Council on Medical Education of the American Medical Associ-

ation. The curriculum was so organized that junior undergraduate students who had completed the prerequisite courses in chemistry, biology, bacteriology and physics were accepted for the program in medical technology. Their senior year was spent in the University Hospital laboratories, where they were given intensive instruction in the various fields of medical laboratory science. Twenty to 30 students completed the program in biochemistry, hematology, microbiology, immunohematology, and clinical microscopy.

Beginning in 1958, ten cytotechnologists were trained annually by the Division of Clinical Cytology in a certificate course in this field. They received one year of intensive instruction in the basic and practical aspects of clinical cytology, which entitled them to be candidates for a certification examination offered by the Board of Schools of Clinical Cytology.

In 1967 the curriculum in medical technology came under the direction of the School of Allied Medical Professions, which was comprised of the divisions of medical technology, physical therapy, occupational therapy, x-ray technology, medical dietetics, medical illustration, nurse anesthesiology, and orthopedic technology. Upon requests of the heads of the various divisions lectures on pertinent fields of pathology were also given to the students in dietics, physical therapy, and occupational therapy.

B. <u>For Graduate Students</u>. The Department has always actively promoted its graduate program leading to degrees of Master of Science and Doctor of Philosophy in fields of clinical pathology, pathologic anatomy, and experimental pathology. Its graduate committee, composed of 15 staff members with a chairman and secretary, supervised all graduate activities. Graduate students were recruited from the ranks of medical students, students with a B.S. degree in the biological sciences, and students holding an M.D. degree.

The requirements for higher degrees were in accord with the rules set forth by the Graduate School, with 45 credit hours and a thesis required for a M.Sc. degree and 135 credit hours and a dissertation required for a Ph.D. degree. A certain number of graduate courses had to be taken in other departments. Graduate students devoted full time to study or also served as residents, interns, or research assistants. Graduate students from other Colleges or departments participated by special permission in all courses given to medical students with the exception of courses in autopsy technique. In addition, the Department offered special courses in minor research problems, graduate seminars in pathology and clinical pathology, and individual instruction in research methods.

The graduate program changed little in the ten-year period. Participation in the program was greatly encouraged by special research training grants awarded to the Department over the past five years by the National Institutes of Health and the American Cancer Society. These grants provided special subsidies for pre- and post-doctoral students interested in research. The number of graduate students steadily increased until at the end of 1968 sixty students were enrolled in our graduate program. Of these, 53 students were working toward M.Sc. and 7 toward Ph.D. degrees. During the ten-year period the Department conferred 54 M.Sc. degrees and 7 Ph.D. degrees. Below is a list of the students who received M.Sc. degrees. It is followed by a list of the students receiving a Ph.D. degree together with the subjects of their dissertations.

Master of Science - 1958-59

Cuppage, Francis E., M.D.
Gilstrap, Marie Ann
Walters, Martha I.

Master of Science - 1959-60

Balmoria, Nicolas E., M.D.
Beery, Grace F.
McCloskey, Sister M. Brigid
Meyer, Iwan O., M.D.

Master of Science - 1960-61

Atillo, Nicanor, M.D.
Baba, Nobuhisa, M.D.
Cabrera, Angel M.
Eguia, Oscar, M.D.
Win, Tun, M.D.

Master of Science - 1961-62

Aihara, Kaoru, M.D.
Edge, James
McMahon, Samuel, M.D.
Mekker, George C., M.D.
Sakurai, Masami, M.D.

Master of Science - 1962-63

Andrew, Floyd
Austad, Ruth
Costas, Maria
Han, Chung Hee, M.D.
Mehrling, Judith E.
Porter, Janice
Ten Raa, Barbara
Wallace, William R., D.D.S.

Master of Science - 1963-64

Grueber, Hans, M.D.
Hackett, Joseph L.

Master of Science - 1964-65

Failoni, Daniel, M.D.
Hathaway, James A., M.D.
Murad, Tariq M., M.D.
Nikolewski, Robert F.

Master of Science - 1965-66

Chang, William W. L., M.D.
Cheng, Homer, M.D.
Schnuda, Nasr, M.B., B.Ch.

Master of Science - 1966-67

Beard, Jayne C.
Chawla, G. S., M.D.
Cofran, Kirk W.
Gipson, Shirley
Justice, Roger
Neagoy, Daniel R.
Schmid, Maria
Sherman, William S.
Wood, Charlene

Master of Science - 1967-68

Aparicio, Oscar, M.D.
Clausen, Kathryn P., M.D.
Cost, Karen
Ellis, Beth J.
Evec, Linda Johnson
Farrell, Eston C., Jr.
Gray, Roberta
Gregory, Kay Ryan
Gursel, Sezai, M.D.
Ha, Tran Trong, M.D.
Hamoudi, Ala B., M.D.
Harville, Keith
Jaeger, Sharon
Maitra, Tushar, M.D.
Monteleone, Paul N., M.D.
Pollock, Helen
Vidyarthi, Subhash, M.D.

List of Ph.D. Recipients with Dissertation Titles

Hossaini, Ali Shah Abdul-Wahhab (1960): A Critical Review and a New Approach to the Serological Detection of Leukoagglutinins.

Scarpelli, Dante G. (1960): Studies on Experimental Carcinoma of the Uterine Cervix.

Taylor, Jane (1964): The Effect of the Blood Type of the Maternal Grandmother on the Occurrence of Erythroblastosis Fetalis in the Grandchild.

Baba, Nobuhisa (1965): Experimental Carcinoma of the Endometrium.

Tewari, Ram P. (1966): Comparative Studies of H. capsulatum and a Trichosporon-like Organism: Morphology, Pathogenicity, Immunology and Cross-Protection.

Murad, Tariq M. (1967): An Ultrastructural Study of Fibrocystic Disease of the Breast.

Hackett, Joseph L. (1968): Mixed Experimental Histoplasmosis and Blastomycosis in Mice.

C. For Resident Training. A fully approved resident program had been established by 1958 which provided for four junior assistant residents, four assistant residents, four senior assistant residents, and four residents. To this were added during the past ten years an approved straight internship in pathology (4 positions) and an approved residency in forensic pathology (2 positions). Recruitment of residents was always a time-consuming administrative duty of the chairman of the Department. Each resident was approved by the executive committee of the Department before he was accepted for residency. Foreign residents had to submit proof that they had passed the ECFMG examination.

The training program was so arranged that the residents spent their first two years in the various divisions of pathology and the remaining two years in the divisions of clinical pathology. They worked in each division for periods varying from three months to one year, thus obtaining during their residency two years' credit in pathology and two years in clinical pathology. Special programs were worked out for those residents who desired training in special fields, such as neuropathology and pediatric pathology. During his tour of duty the resident was under the personal supervision of the chief of his division, who submitted an efficiency report at the end of each training period. At the end of their training periods most residents had acquired sufficient training to become eligible for the American Board examination in pathology and clinical pathology. The addition of a fifth year of training in the form of a straight internship in pathology gave residents opportunity to deviate from their rigid training schedule and devote part time to research in pathology. It also made it possible for them to obtain training in the

special fields of pathology or to spend some time at other institutions. The residency in forensic pathology was discontinued in the past two years because of lack of participation and inadequate training facilities.

The "on-the-job" training of residents consisted in participation in the service activities of the division to which they were assigned. In the Division of Pathologic Anatomy the residents performed all autopsies and dictated the protocols, which were then checked by the professional staff of the Division. In the Division of Surgical Pathology the residents described the specimens and arrived at a diagnosis from the histological examination, which was then further checked by the chief of the Division. In the various laboratory divisions the residents acquainted themselves with the important techniques and served as liaison between the technical staff and the clinical staff of the hospital.

In addition to the duties performed in each division, the residents obtained extensive training through numerous conferences that they, as well as residents of other departments, were invited to attend. These were "Scopicon" conferences on recent autopsy material held three times a week for residents assigned to the Division of Pathologic Anatomy; a weekly surgical pathological conference for residents assigned to the Division of Surgical Pathology; weekly conferences for pathology residents and residents in the fields of neuropathology, obstetrical and gynecological pathology, and genitourinary pathology; a weekly tumor conference in conjunction with the departments of Radiology and Surgery, and a weekly death-round conference in cooperation with the Department of Medicine. Representatives from the Pathology staff also attended the grand rounds of the departments of Surgery, Obstetrics and Gynecology, and Pediatrics in order to show slides of pertinent cases and discuss the pathological problems. Clinicopathological

conferences were also held at the affiliated Children's Hospital, Columbus State Hospital, and the Dayton Veterans Administration Hospital. This heavy conference schedule required approximately 1084 hours per year of teaching duty.

Approximately one-third of the residents trained by the Department in the past ten years are now associated with universities. Some of them entered government service and are now active in the Veterans Administration and the Public Health Service. Approximately 50 per cent of the residents are now practicing pathologists in hospitals throughout the United States. Our foreign residents have come from 24 countries. Over 60 per cent have returned to their respective countries to teach pathology in their medical schools; others have remained in this country.

D. Visiting Professor Program. The faculty of the Department was always most interested in enriching its teaching program by bringing in a number of visiting professors every year, representing various specialties of pathology. The expenses for visiting professors were defrayed by grants obtained from the American Cancer Society and the National Institutes of Health. The visitors gave one or two lectures before the second year medical students and special lectures to the residents and faculty of the Department. Sometimes they also addressed the Ohio Society of Pathologists or the Central Ohio Society of Pathologists. Selection of the visiting professors was usually made in the year preceding their visits by the executive committee of the Department. The list of visiting professors for the years 1958-68 follows:

1958-59

Dr. Heinz Grunze, Free University of West Berlin
Dr. A. G. E. Pearse, Postgraduate Medical School, London, England
Dr. Lorenz E. Zimmerman, Armed Forces Institute of Pathology

1959-60

Dr. Lauren V. Ackerman, Washington University, St. Louis, Mo.
Dr. Hanns-Werner Boschann, Free University of West Berlin
Dr. Th. Schiebler, University of Kiel, West Germany
Dr. George L. Wied, University of Chicago
Dr. Wolf W. Zuelzer, Wayne State University, Detroit, Mich.

1960-61

Dr. L. Boerema, University of Amsterdam, Netherlands
Dr. Frank J. Dixon, University of Pittsburgh, Pittsburgh, Pa.
Dr. Herbert Z. Lund, The Moses H. Cone Memorial Hospital, Greensboro, N.C.
Dr. Thaddeus Mankowski, Institute for Cancer Research, Philadelphia, Pa.

1961-62

Dr. James B. Arey, Temple University, Philadelphia, Pa.
Dr. Orville T. Bailey, University of Illinois, Chicago, Ill.
Dr. William Boyd, University of Toronto, Toronto, Canada
Dr. Ludwick Gross, Veterans Administration Hospital, Bronx, N.Y.
Dr. J. L. Sirlin, Institute of Animal Genetics, Edinburgh, Scotland
Dr. Henry A. Telch, Lawrence General Hospital, Lawrence, Mass.

1962-63

Dr. Jesse E. Edwards, Charles T. Miller Hospital, St. Paul, Minn.
Dr. David A. Karnofsky, Sloan-Kettering Institute for Cancer Research, New York, N.Y.
Dr. Hans Popper, Columbia University, New York, N.Y.

1963-64

Dr. Victor A. McKusick, Johns Hopkins University, Baltimore, Md.
Dr. Magnus Nasiell, Karolinska Institute, Stockholm, Sweden
Dr. Conrad L. Pirani, University of Illinois, Chicago, Ill.
Dr. M. June Scudamore, Hamilton Civic Hospitals, Hamilton, Ontario
Dr. F. Unterharnscheidt, Max-Planck Institute, Munich, Germany
Dr. Arthur C. Upton, Oak Ridge National Laboratory, Oak Ridge, Tenn.

1964-65

Dr. George Brecher, Hematology Service, National Institutes of Health, Bethesda, Md.
Dr. P. Lopes Cardozo, University of Leiden, Netherlands
Dr. Robert A. Good, University of Minnesota, Minneapolis, Minn.
Dr. A. F. Howatson, University of Toronto, Canada

Dr. Robert B. Jennings, Northwestern University, Chicago, Ill.
Dr. Paul E. Lacy, Washington University, St. Louis, Mo.
Dr. Robert J. Lukes, University of Southern California, Los Angeles, Calif.
Dr. Walter Sandritter, University of Giesen, Germany
Dr. Konstantin Scharenberg, University of Michigan, Ann Arbor, Mich.

1965-66

Dr. Walter C. Bauer, Washington University, St. Louis, Mo.
Dr. Kenneth M. Brinkhous, University of North Carolina, Chapel Hill, N.C.
Dr. William M. Christopherson, University of Louisville, Louisville, Ky.
Dr. Emmanuel Farber, University of Pittsburgh, Pittsburgh, Pa.
Dr. Stephen Gallager, M. D. Anderson Hospital, Houston, Texas
Dr. Richard C. Hard, Jr., University of Chicago, Chicago, Ill.
Dr. James G. Hirsch, Rockefeller Institute, New York, N.Y.
Dr. Bernard L. Klionsky, University of Pittsburgh, Pittsburgh, Pa.
Dr. W. Wechsler, Max-Planck Institute for Brain Research, Cologne, W. Germany

1966-67

Dr. Hanns-Werner Boschann, Free University of West Berlin
Dr. Bradley E. Copeland, N. E. Deaconess Hospital, Boston, Mass.
Dr. Paul Lopes Cardozo, University of Leiden, Netherlands
Dr. J. N. P. Davies, Albany Medical College of Union University, Albany, N.Y.
Dr. Hugh Davis, Johns Hopkins University, Baltimore, Md.
Dr. Milton Helpern, Chief Medical Examiner, City of New York
Dr. Peter C. Kennedy, University of California School of Veterinary Medicine, Davis, Calif.
Dr. Benjamin Landing, University of Southern California, Los Angeles, Calif.
Dr. C. P. LeBlond, McGill University, Montreal, Canada
Dr. James L. Luke, Associate Medical Examiner, City of New York
Dr. James W. Reagan, Western Reserve University, Cleveland, Ohio
Dr. Mojmir Sonek, University of Brno, Czechoslovakia
Dr. Colin Wood, University of Maryland, Baltimore, Md.

1967-68

Dr. Lent C. Johnson, Armed Forces Institute of Pathology, Washington, D.C.
Dr. Stanley L. Robbins, Boston University, Boston, Mass.
Dr. David Seligson, Yale University, New Haven, Conn.
Dr. Floyd R. Skelton, State University of New York, Buffalo, N.Y.
Dr. K. L. Zülch, Max-Planck Institute for Brain Research, Cologne, W. Germany

III SERVICE RESPONSIBILITIES

The service responsibilities of the Department of Pathology included the supervision of all clinical laboratory tests and the performance of all pathological examinations of the University and Children's hospitals as well as consultation service at the laboratories of the affiliated hospitals (Columbus State Hospital and the Dayton Veterans Administration Hospital). For this purpose these responsibilities were divided among a number of divisions, each headed by a Board-approved M.D. or Ph.D.

In October 1959, Dr. Reinhart resigned to accept a position with the Veterans Administration and the Southwestern Medical School at Dallas, Texas. Dr. Reinhart had directed the clinical laboratories at University Hospital since 1932, had served as acting chairman of the Department from 1942 to 1945 during the period of Dr. von Haam's active military service, and as vice chairman for many years. He also directed the program in medical technology. He was succeeded by Dr. Colin R. Macpherson, who had joined the laboratory staff in 1956.

The following paragraphs contain a short description of the principal duties of each service division. At the end of this section the work load of the various divisions over the past eight years is tabulated in order to demonstrate the increasing burden of this activity. (Table 1)

Division of Pathologic Anatomy. In the past ten years the division was under the successive direction of Drs. Bloodworth, Berger, Cuppage, and Baba. It performed all autopsies of the University Hospital except for those on newborn and stillborn infants. The staff included two instructors and four or five residents. The number of autopsies fluctuated between 509 and 649 annually, the autopsy percentage between 67% and 74%. The professional staff

was supported by a technical staff consisting of four to eight morgue assistants, a pool of typists, and four to five tissue technicians. Interesting specimens were photographed by the autopsy surgeons, who received instruction in this technique by the Department photographer. Specimens were saved and used for demonstration purposes. The autopsy protocols, which were dictated by the autopsy surgeon as soon as possible after completion of the autopsy, always contained a detailed abstract of the clinical history and a gross description of the organs, the microscopic examination of the tissues, and bacteriological and chemical data obtained by examination of tissue fluids. The final diagnosis was arranged according to the principal disease and ancillary and incidental diagnoses of lesions found in each organ system. A short note at the end of the diagnosis summarized the important features of the autopsy. The diagnoses were coded and put on computer tape for later retrieval studies. Approximately one month was allowed for completion of the autopsy protocol. Each protocol was presented to an instructor or to the chief of the division for correction. Completed autopsy protocols were bound in volumes and placed in the departmental library. The past ten years have seen little change in these procedures. Because of the shortage of manpower, the protocols were shortened. During the last year the clinical history was entirely omitted and replaced by a copy of the "Clinical Summary" of the service.

Division of Forensic Pathology. In the past ten years the Division of Forensic Pathology was under the successive direction of Drs. Bloodworth, Scarpelli, Buerger, and Baba. The division performed all autopsies on coroners' cases, most of which came from Franklin County. The staff of the Division of Pathologic Anatomy was utilized until the last year, when a special coroner's pathologist was employed. The number of autopsies fluctu-

ated annually between 200 and 450 and included cases of violent death, natural sudden death, and death from undetermined cause. The division worked in close cooperation with the Columbus Police Department and the district Bureau of Criminal Investigation. Toxicological specimens were sent to the Department of Pharmacology for examination. In cases which went into court the autopsy surgeon often had to serve as material witness. The division offered a special residency in forensic pathology which was approved by the Council on Medical Education. However, due to lack of interest in this residency, financial support was withdrawn in 1966.

Division of Surgical Pathology. The Division of Surgical Pathology moved into new quarters in the north wing of the third floor of University Hospital in 1960. It was under the successive directorships of Drs. Old, Horava, Barter, and Holaday. The professional staff, in addition to the director, was composed of one or two instructors, two residents of the Department of Pathology, and at some periods a resident of the Department of Surgery and one from the Department of Obstetrics and Gynecology. The total number of accessions varied from year to year between 7,900 and 8,900 and the number of frozen sections performed between 800 and 1,000. The gross specimens were examined and described by the residents, who then prepared blocks for embedding. Stained sections were examined by the resident staff and checked by an instructor or the chief of the division. Interesting specimens were demonstrated in weekly surgical pathology conferences to the resident staff of the Department and to resident staffs of the departments of Surgery, Obstetrics and Gynecology, and Urology. A coding system was instituted in the last ten years, using the "Systematized Nomenclature of Pathology" for the pathological diagnosis.

Division of Clinical Cytology. The Division of Clinical Cytology,

under the direction of Dr. Ceelen, was created on the basis of previous extensive research work in cytology which produced a large demand for routine service work. These research studies, undertaken in cooperation with the National Cancer Institute, were the Human Comparative Cytology and the Colon Cancer Survey projects. The work load during the years of the two projects rose to 35,000 cases but dropped after termination of these projects to 14,000 cases annually. In 1968 it again increased to 19,000 cases. The division assumed full responsibility for all phases of cytology with the exception of the cytology of the peripheral blood, which has remained in the research stage. It also collaborated in the training of cytotechnologists in the approved School of Cytology in which eight to twelve cytotechnologists were trained each year.

Division of Clinical Bacteriology. The Division of Clinical Bacteriology was supervised during the past ten years by Dr. C. R. Macpherson, who was assisted after 1961 by two residents and after 1963 by one additional instructor. The work load in the division, which included all bacteriological and serological examinations until 1964, varied between 450,000 and 550,000 examinations annually. Even after transfer of all serological tests to the newly created Division of Immunohematology the division still performed between 540,000 and 590,000 tests in the years 1965 to 1968.

Division of Transfusion Service. This division was also under the direction of Dr. Colin Macpherson. In 1964 serological examinations were assigned to the Transfusion Service. In 1967, immunoelectrophoresis, developed by Dr. Gerald Penn in this division, was added and the name of the division was changed to the Division of Immunology. These two additional fields increased the work load of the division from 280,000 to 450,000 examinations. Its staff consisted of two residents and in 1962 a full-time

instructor was added.

Division of Clinical Hematology. This division was under the direction of Dr. Oscar Eguia and then Dr. Thomas D. Stevenson. It took care of a main laboratory in clinical hematology and four floor laboratories and had the responsibility for the performance of routine hematological studies on in- and out-patients. It also supervised the urine analyses, examination of feces and of spinal fluid. Dr. Stevenson was assisted by one resident. In the last year it conducted a quality control program which included white blood counts and the determination of hemoglobin, hematocrit, prothrombin time, spinal fluid proteins, and urine proteins. It adopted many new methods of automation, and its annual work load increased from 298,000 to 397,000 examinations.

Division of Clinical Biochemistry. The Division of Clinical Biochemistry was organized under the supervision of Dr. George Shinowara, who resigned in September 1959 to accept a position with the laboratories of Bellevue Hospital in New York City and with New York University. It was then under the direction of Dr. Walter Frajola, who was succeeded in 1963 by Dr. H.-D. Gruemer from Tufts University Medical School in Boston. The director was assisted by two residents and since 1964 by one additional full-time assistant professor. Because of the increased demand for services, a second automatic analyzer was installed and numerous new tests for the diagnosis of metabolic diseases and enzyme abnormalities were introduced. A planning laboratory was created the duty of which was to study the technical aspects of new tests before they were accepted as a routine laboratory method. A control laboratory for the radioisotope program was also created in conjunction with the Department of Radiology. Automation of the chemical laboratory tests was intensified with the purpose of carrying out admission test

batteries on all patients. As part of the hospital information system, the division acquired a LINC-8 computer in order to computerize all clinical laboratory tests for speedy transmission to the hospital wards. The work load in clinical biochemistry increased from 186,000 tests to 500,000 tests a year in a five-year period.

Division of Pediatric Pathology. The Division of Pediatric Pathology was organized under the direction of Dr. William A. Newton, pathologist of Children's Hospital, an affiliate hospital with the Ohio State University Health Center. Dr. Newton's division was composed of one or two associate pathologists, one or two instructors, and two to three residents. It performed between 300 and 400 autopsies annually on patients of Children's Hospital and on stillborn and premature infants from the Obstetrics and Gynecology service of University Hospital. It examined between 4,000 and 6,700 surgical specimens and performed from 152,000 to 276,000 laboratory tests per year. As part of the organization of Children's Hospital it worked in close cooperation with the clinical staff of the hospital and participated in the teaching activities of the Department of Pediatrics. It had its own electron microscope laboratory for examination at the ultrastructural level of tumors in children and had its own cytogenetic laboratory for the study of karyotypes in abnormal children.

Division of Pulmonary Pathology. This division was headed by Dr. P. C. Pratt until he left the University in 1966. It represented the pathology laboratory of the Ohio Tuberculosis Hospital. Dr. Pratt was a lung pathologist of considerable repute and devoted most of his time to research in pulmonary diseases. In addition he supervised the routine laboratory work of the hospital, a laboratory which performed annually between 46,000 and 50,000 tests. One year after Dr. Pratt's departure, the status of the

hospital was changed and became a part of the University Hospitals, designated as Means Hall, with its laboratory activities amalgamated with those of the University Hospital, and the division ceased to exist.

Division of Neuropathology. The Division of Neuropathology was first under the direction of Dr. Wolfgang Zeman, who created the division when he came to the Department of Pathology in 1956 from the University of Michigan. He was succeeded in 1960 by Dr. Leopold Liss, who came from the same university. The division had the responsibility for examining all neurological material from the divisions of Pathologic Anatomy, Forensic Pathology, and Surgical Pathology. Most of the work consisted in dissection of the brains and the application of special stains in order to interpret correctly the neuropathological lesions. From 370 to 650 brains a year were examined, in addition to the examination of all tumors of the central and peripheral nervous systems removed by the Division of Neurosurgery. Correlation of brain morphology and neurological symptoms was demonstrated in a weekly conference to the residents in neurology, psychiatry, and pathology, and the division also participated in the clinical conferences of the Department of Psychiatry. Dr. Liss was supported by one resident who chose specialty training in neuropathology for his Board requirements. The division also conducted a very active research program in a special tissue culture laboratory which investigated various types of cell biology.

Division of Geriatric Pathology. The Division of Geriatric Pathology was created after the laboratory of the Columbus State Hospital became affiliated with the Department of Pathology of The Ohio State University. Dr. O. J. Lowy, the full-time director of this laboratory, served as director of the division. Since the population of this hospital consisted mostly of elderly patients, special examinations were directed to hemopoietic, hepatic,

and renal disorders of this age group. The division performed up to 125 autopsies a year on geriatric patients and up to 30,000 clinical laboratory tests. The division was discontinued in 1962.

Laboratory of Cellular Pathology. This division was created in 1960 through the enthusiastic endeavors of Dr. D. G. Scarpelli, then associate professor of pathology, and his group (Drs. Cuppage, Greider, Volk, Murad) and a considerable number of graduate students from other departments of the College of Medicine and the University, who engaged in studies of the ultrastructure of cells. The service function of this division was mainly concerned with the diagnosis of renal disease from percutaneous needle biopsies. With close cooperation between the clinicians, it was possible to recognize early cases of glomerulonephritis and pre-eclamptic renal disease. The division also collaborated with various divisions of the Department of Medicine on detailed studies of selected patients in whom electron-microscopy and histochemistry could shed some light on the nature and extent of their disease processes. The results of these studies were presented in selected conferences and stimulated great interest in basic medicine among the participating clinicians. The division was discontinued in 1965 after Drs. Scarpelli, Cuppage, Volk, and Greider left Ohio State University for other academic positions.

Division of Photography. The Division of Photography was established in 1962 when it became obvious that the photographic demands were too heavy to be handled by one departmental photographer. The division consisted of one photographer and his assistant with part-time help. They prepared all slides and prints for teaching purposes, forensic pathology, and research presentations and exhibits at medical meetings. From 21,000 films and prints in 1963, the work load increased to nearly 50,000 in 1968. This division also had

the responsibility for instructing the residents and research personnel of the Department in photographic methods and had custody of the ever-increasing teaching slide collection of the Department, which in the past 30 years has gradually replaced the museum of pathological specimens.

Table 1

Service Load of the Various Divisions of the Department of Pathology

A: 1960-1964

Departmental Division	1960-1961	1961-1962	1962-1963	1963-1964
Pathologic Anatomy	649 (18.8%)	617 (71%)	632 (68%)	647 (74%)
Surgical Pathology	8,025	7,877	8,499	8,663
Forensic Pathology	204	288	338	325
Clin. Bacteriology	Bact.+Serol. 468,347	Bact.+Serol. 427,863	Bact.+Serol. 239,773	Bact.+Serol. 559,132
Transfusion Service	286,480	157,891	379,343	317,756
Clin. Hematology	298,565	299,460	300,000+	301,734
Clin. Biochemistry	186,582	202,800	208,323	234,220
Clin. Cytology	28,617	35,316	19,787	13,918
Pediatric Pathology				
Autopsies	401	416	370	350
Surgical Spec.	4,209	4,180	5,525	6,422
Clin. Lab. Tests	152,813	162,923	165,166	192,230
Pulmonary Pathology	46,320	46,324	50,782	52,242
Neuropathology				
Brain Exam.	555	369	423	443
Tissue Cultures	---	81	108	68
Photography	No report	No report	21,101	28,851

Table 1

Service Load of the Various Divisions of the Department of Pathology

B: 1965-1968

Departmental Division	1964-1965	1965-1966	1966-1967	1967-1968
Pathologic Anatomy	594 (73.4%)	642 (70%)	509 (67%)	541 (69%)
Surgical Pathology	8,341	8,909	7,937	8,719
Forensic Pathology	449	230	300	245
Clin. Bacteriology	Bact.+Serol. 552,265	543,245	580,632	591,650
Transfusion Service	295,792	Tran.+Serol. 455,434	Tran.+Serol. 472,860	Tran.+Serol. 441,361
Clin. Hematology	325,919	360,689	372,562	397,582
Clin. Biochemistry	265,325	321,451	365,487	509,781
Clinical Cytology	12,899	13,771	15,045	18,852
Pediatric Pathology				
Autopsies	318	339	306	310
Surgical Spec.	6,414	6,450	6,766	6,674
Clin. Lab. Tests	209,019	223,362	248,394	276,085
Pulmonary Pathology	48,937	50,201	-----	-----
Neuropathology				
Brain Exam.	541	376	536	646
Tissue Cultures	125	70	93	65
Photography	32,419	38,467	53,589	49,904

IV RESEARCH ACTIVITIES

The Department of Pathology has always regarded research as an essential function. Research experience is the best basis for good teaching because it adds the value of the personal experience of the teacher to the knowledge that can be gained from books. Therefore the advantage of research has always been stressed to the junior members of the Department not only for the good of the institution but for their own development.

In 1958, Dr. von Haam and his group were in the third year of the Comparative Human Cytology Project which was supported by the National Cancer Institute and the American Cancer Society and which investigated the applicability of clinical cytology in its various methods for the early diagnosis of cancer to other areas of the human body. A total of 440,000 cases were examined with 5,480 patients having histologically confirmed malignant tumors. The areas examined included the respiratory tract with special emphasis on sputum examination by Dr. Guenther Ceelen; the gastrointestinal tract by means of gastric and colonic washings by Dr. R. J. Thabet; the genitourinary tract studied by Dr. Eileen Macfarlane; the cytology of tissue fluids (pleural effusions, ascites) studied by Dr. Ceelen; the cytology of the oral cavity, studied by Dr. George App, and the cytology of skin lesions and breast secretions, studied by Dr. G. J. Selbach.
Dr. von Haam, with the cooperation of graduate students, studied aspirations from lymph nodes and solid and cystic tumors. From these comprehensive studies it was concluded that clinical cytology in its various modifications had proved of great diagnostic value not only for cancer of the female genital tract but also for cancer of the respiratory tract, esophagus, oral cavity, serous cavities, bladder, brain, and lymph node metastases. It

proved of questionable value for cancer of the stomach, colon, breast, skin, kidneys, and prostate and for solid tumors.

Following these investigations, qualitative control studies of vaginal smears for the cytological diagnosis of cancer of the cervix were undertaken with Dr. E. M. Miller in cooperation with the Department of Obstetrics and Gynecology. They consisted in the evaluation of material obtained by vaginal pool aspiration without visualization of the uterine cervix, cervical smears obtained by cervical scrapings with visualization of the cervix, and endocervical aspirations. They also included investigation of the value of the "do-it-yourself" method proposed by Dr. Hugh Davis of Johns Hopkins University which, if successful, would tremendously facilitate screening of the indigent population, a group which thus far had not been screened by conventional methods. As a corollary to this study, Dr. von Haam with the cooperation of Major Robert Nikolewski started in 1966 a cytological survey of the dependents of the United States Air Force for the presence of malignant cells in the female genital tract. The data of both studies were computerized and represent a valuable source for further clinical and pathological information on cancer of the uterine cervix.

Dr. von Haam, with Dr. D. G. Scarpelli and Dr. N. Baba, continued to use exfoliative cytology as a means of studying the progress of experimental cancer of the cervix and uterus. With his standardized technique, he was able to produce squamous carcinoma of the uterine cervix in mice of certain susceptible strains with various chemical carcinogens and found this lesion to be similar in morphological and biological aspects to carcinoma of the human uterine cervix. It showed the same histological pattern, the same clinical course, and the same development of metastases, moreover was always preceded by cytologically recognizable precancerous lesions. Methyl-

cholanthrene also produced adenocarcinomas of the endometrium in rabbits and squamous-cell carcinomas in rats and mice in a high percentage of the animals. The application of estrogenic substances (diethylstilbestrol) promoted the chemical production of endometrial carcinomas but did not act as a primary carcinogen.

In cooperation with Dr. A. Horava, Dr. von Haam studied the experimental production of tumors of the large intestine. Insertion of carcinogen-impregnated cotton strings into various regions of the large intestine produced carcinomas in situ and adenocarcinoma of the cecum in rats. Other tumors produced by this method were lymphosarcomas and leiomyosarcomas of the colon. The string method also proved successful in the induction of kidney tumors and tumors of the lung in mice (Dr. J. L. Stevenson and Dr. von Haam).

After Engell's discovery of circulating cancer cells in the peripheral blood stream, Dr. von Haam with a group of researchers from Johns Hopkins University and the University of West Virginia started a critical study of the occurrence of malignant cells in the blood streams of cancer patients before and after surgery. Collaborating with Dr. von Haam in the Ohio State University group were Drs. M. Sakurai, G. J. Selbach, and T. D. Stevenson. The Ohio State University group was able to concentrate circulating cancer cells by various chemical, enzymatic, and physical procedures and could demonstrate unequivocally malignant cells in the blood streams of 30% of the patients with widespread cancer or in cadavers of cancer patients. At the present time their detection appears to have no diagnostic or prognostic significance.

The immunological recognition of malignant cells by means of direct or indirect immunofluorescence was studied (Drs. von Haam and J. L. Stevenson)

in cooperation with the Department of Microbiology. Rabbits were immunized with normal and cancerous tissue homogenates and extracts containing RNA and DNA of lyophilized malignant and benign human tissues. The tissue antibodies were determined qualitatively by the agar-gel diffusion method of Ouchterlony and quantitatively by the method of passive erythrocyte agglutination. Ehrlich mouse ascites tumor cells served as experimental model. After the presence of antibodies directed toward the various tumor antigens was established, the antigen-antibody reaction was then demonstrated by the direct and indirect methods of immunofluorescence. However, only in one-third of the malignant human tumors investigated was a positive reaction elicited.

Stimulated by a series of publications stressing the presence of malignancy-associated changes in the normal cells of cancer patients, Drs. von Haam, T. D. Stevenson, Joan Mattson, and Robert Finch organized a triple-blind study to check on the presence of three different types of malignancy-associated changes reported in the current literature. White blood cells and buccal epithelial cells of cancer patients were studied with light- and electron-microscopy. The results thus far have not supported the existence of malignancy-associated changes as a valuable diagnostic tool.

In 1960, a Laboratory of Cellular Pathology was established in the Department of Pathology in order to investigate disease as it affects our cells—the fundamental unit of our bodies. Although the majority of these investigations were performed by means of experimental pathology, a number of studies centered around unusual clinical entities with biopsy material from human patients. Dr. D. G. Scarpelli and Dr. Marie Greider became principal investigators of this laboratory and made great efforts to interest

selected students of medicine and biology in basic research. Studies completed in this laboratory were: the cytology and biochemical mechanism of experimentally induced nephrocalcinosis by means of hypervitaminosis (Dr. Scarpelli); the ultrastructure and function of islet cell tumors of the pancreas (Dr. Greider); the ultrastructural effect of Triparanol upon the adrenal cortex (Dr. T. L. Volk); the ultrastructural changes produced by varying periods of anoxia in the rat kidney (Dr. W. W. Chang). Other studies included an electron-microscopic study of liposarcoma (Drs. Scarpelli and Greider); electron-microscopic study of the retina (Dr. Scarpelli and E. L. Craig); the effect of testosterone on the protein synthesis of the kidney (Drs. Scarpelli and D. Failoni); the role of the endoplasmic reticulum and mitochondria on steroid synthesis of the adrenal cortex (Dr. Volk), and the effect of dinitrophenol on the kidney and heart mitochondria (Dr. Scarpelli). As part of Dr. Scarpelli's participation in the study of the biology of the heart which was under the supervision of the Department of Medicine, studies on the ultrastructural changes of the heart muscle fibers were done on biopsies of the dog heart (Drs. R. F. Leighton, A. M. Weissler, and Scarpelli). Dr. F. E. Cuppage, who joined the Department in 1965, studied regeneration of the nephron after mercuric chloride nephrosis; congenital nephritis; the effects of Imuran on glomerulonephritis; and congenital hematuric nephropathy. Dr. T. M. Murad conducted studies of the ultrastructure of the pericyte and myoepithelial cells in various pathological conditions of the female breast.

Dr. J. M. B. Bloodworth continued his work on the etiology and nature of degenerative vascular diseases with special emphasis on the lesions of diabetes mellitus. He tried to reproduce the nodular lesions of diabetic glomerulosclerosis by the administration of hormones, sesame oil, and nitro-

gen mustard and by the production of choline deficiency liver cirrhosis and carbon tetrachloride poisoning. All the lesions had, in common, foci of inflammation with protein breakdown and proliferation of many histiocytes. He developed the hypothesis suggesting that the kidney lesions might be due to the autoimmune production of antibodies and investigated this hypothesis with the classical techniques of immunology. His experimental work was complemented by extensive studies on cadaver and surgical material concerning the morphology of the retinal vascular lesions in diabetes. He discovered that basement membrane thickening occurred in most capillaries of the diabetic. Dr. Bloodworth continued this work at the University of Wisconsin, where he went as professor of pathology in 1962.

The staff of Pediatric Pathology continued their study on the effect of chemotherapeutic agents on leukemia and cancer in children. Dr. Charles Reiner of the division continued his investigations on coagulation defects in children with congenital heart disease, and the determination of heparin-like substances in the blood and body tissues. Dr. D. R. Kmetz introduced clinical cytology into the pediatric laboratory with a method for the diagnosis of brain tumors in children. Dr. K. Misugi conducted an electron-microscopic study of malignant tumors of children. In the newly established chromosome laboratory, chromosome abnormalities of leukemia and pediatric tumors were investigated. Members of this division also carried out studies on red-cell enzyme deficiencies.

Dr. Leopold Liss and his staff in Neuropathology studied the histology of the neurosecretory substance in the human hypothalamo-hypophyseal system, senile brain changes, gliomas in tissue culture, and demyelinating diseases. Dr. Liss and Dr. H.-D. Gruemer investigated the effect of phenylalanine on cells in tissue culture and in a specially susceptible strain of mice.

Dr. P. C. Pratt conducted extensive research on the pathogenesis of various types of emphysema using dried and inflated lungs. He conducted with Dr. E. P. Hiatt studies on the effect of oxygen toxicity in animals, and in collaboration with the Department of Radiology investigated the tissue reaction of barium in animals.

Dr. C. R. Macpherson investigated the aspects of hospital-acquired infections and completed a detailed study of autopsy bacteriology technique with interpretation of the results. He also studied the serological changes in Rh incompatability and the production of hemolytic anemia in the chick embryo. In the field of immunohematology Dr. Macpherson and his staff studied methods for the development of platelet concentrates, the preparation of antihemophilic factor, and the introduction of electrophoretic techniques.

Dr. T. D. Stevenson, from the Division of Hematology, investigated the techniques for the isolation and identification of circulating tumor cells in collaboration with Dr. von Haam. His division also conducted a survey on the significance of hypersegmentation of polymorphonuclear leukocytes; the effect of drugs on the cytogenetics of the bone marrow; the occurrence of extramedullary hematopoiesis; and the effect of chemotherapeutic agents on folic acid metabolism.

Dr. W. J. Frajola pursued his research on serum enzyme measurements in various diseases. His laboratory also studied serum enzyme measurements in the United States astronauts. His successor, Dr. H.-D. Gruemer, studied the distribution, elimination, and metabolism of amino acids in patients with inborn errors of metabolism. He also investigated the toxicity of phenylalanine on brain tissue. Dr. J. R. Allen in the same division studied the lipid changes in the vitamin B and vitamin E deficient animal and in the mouse with muscular dystrophy. The division was currently engaged in the

clinical evaluation of the LDH isoenzymes in patients suffering from heart ailments.

Dr. Jack C. Geer, who succeeded Dr. von Haam as chairman of the Department in 1967, initiated an extensive study in the field of atherosclerosis. With members of the Department of Physiological Chemistry he studied the sphingosine base and plasmogenic aldehyde composition of human atherosclerotic lesions. The working hypothesis of these studies was that, at a stage of involution of the vascular lesion, necrosis of lipid-containing cells occurs which incites a desmoplastic reaction. The precise identification of the lipid in the lesion should provide a basis for proposing pathways of lipid metabolism in an artery wall. Dr. N. Baba studied the effect of ischemia produced experimentally in the isolated perfused rat heart. He also studied the ultrastructural change in the heart muscle fibers of the hypertrophied rat heart after constriction of the aorta and the ultramicroscopic changes of the cells of the sinus and atrioventricular nodes in ischemia and cardiac hypertrophy. The research program in cardiovascular disease was enhanced by the addition to the faculty of Drs. Sanford Bishop and Howard Newman. Dr. Bishop also held an appointment in the Department of Medicine working in the Biology of the Heart Program. Dr. Newman held appointments in the Department of Preventive Medicine and in the Department of Physiological Chemistry. Dr. Bishop and Dr. Newman were involved in a multidisciplinary approach to the problems of cardiovascular disease—a philosophy that the Department of Pathology desired to extend to other fields of research.

The results of our research activities are reflected in the number of publications, presentations and exhibits during the ten-year period. Since universities traditionally provide meager funds for research, most

of the funds to defray the expenses for the research work performed in the Department came from grants which were secured by various members of the Department. In the following table the number of our publications, the number of presentations including exhibits, and the number of individual grants with the total amount of annual funds are presented. The data for the 1958-59 and 1959-60 grants are not available. From this table it can be seen that members of our department published 32-57 papers, gave 17-72 talks and exhibits, and were supported by 26-49 grants per year, amounting to between $310,000 and $778,000. Most of the funds for our research came from governmental institutions such as the National Cancer Institute and the U.S. Public Health Service, but considerable sums were also obtained from private funding agencies such as the American Cancer Society, the Damon Runyon Fund, and the American Heart Association. A few of the investigations were performed on a contractual basis, such as the toxicity studies on rubber compounds and the screening of dependents of the USAF for cancer of the cervix and vagina.

Table 2

Number of Publications, Presentations, and Research Grants

Department of Pathology 1958-1968

Year	Publications	Presentations (Papers and Exhibits)	Grant Support	
			No. of Grants	Amount/Year
1958-59	50	32	Data not available	Data not available
1959-60	41	17	Data not available	Data not available
1960-61	55	40	29	$518,425
1961-62	49	46	26	310,242
1962-63	57	38	35	422,095
1963-64	34	40	38	434,002
1964-65	57	69	40	488,404
1965-66	55	61	49	671,300
1966-67	32	72	36	755,975
1967-68	34	48	35	778,906
Total	464	463	288	$4,379,349

V HONORS AND AWARDS

During the past ten years many members of our faculty received awards and honors for their work. These consisted in medals given by medical societies and election to offices and appointments to important committees of these societies. At the request of the editor of the ten-year history of the College of Medicine, we are listing these honors and awards under the name of the faculty member who received them. The names are given in alphabetical order.

Dr. J. M. B. Bloodworth, Jr.

Co-Chairman, Session on Pancreas, American Society for Experimental Pathology (1961)
Lilly Award, American Diabetes Association (1963)

Dr. W. J. Frajola

Treasurer, Electron Microscopic Society of America (1961-65)
President, Electron Microscopic Society of America (1966)
Organizing Committee, Fifth International Congress of Electron Microscopy (1961)

Dr. Jack C. Geer

Member of the Nutrition Study Section for the Division of Research Grants, National Institutes of Health (1964-68)

Dr. Marie Greider

Research Career Development Award, National Institutes of Health (1966-1968)

Dr. C. R. Macpherson

President, Ohio Society of Pathologists (1965)
Appointed State Representative, American Association of Blood Banks (1967)
President, Ohio Association of Blood Banks (1968)
Elected as Chairman, Board of Schools of Medical Technology, American Society of Clinical Pathologists (1968)

Dr. W. A. Newton, Jr.

Council, Midwest Society for Pediatric Research (1961-62)
President, Midwest Society for Pediatric Research (1964-65)
Appointed to Board of Directors, Franklin County Unit, American Cancer Society (1964)
Chairman, Pathology Committee of Children's Cancer Study Group A, National Institutes of Health (1967-68)

Dr. D. G. Scarpelli

Recipient of Career Development Award Fellowship, National Institutes of Health (1958-66)
Co-Chairman, Session on Pancreas, American Society for Experimental Pathology (1961)
Member of survey group for cancer of the stomach in Iceland, sponsored by Icelandic government, National Institutes of Health, and the Iceland Cancer Society (1962)
Appointed member of Pathology B Study Section, National Institutes of Health (1963)
Honorary Doctor of Science degree, Baldwin-Wallace College (1966)

Dr. Emmerich von Haam

Award of Merit, American Cancer Society (1958)
Selected "Man of the Year" of College of Medicine, Ohio State University (1959)
Member of Editorial Board, "Acta Cytologica" (since 1960)
Vice President, Inter-Society Cytology Council (1960)
President, American Society of Cytology (1962)
Certificate of Merit for clinical cytology exhibit (with Drs. Ceelen, Macfarlane, Thabet and Selbach), Ohio State Medical Association (1962)
Certificate of Merit for scientific exhibit on the "Spectrum of Clinical Cytology (with Drs. Ceelen, Macfarlane, Thabet and Selbach), American Medical Association (1962)
Secretary-Treasurer, International Academy of Cytology (since 1964)
Appointed member of Study Section on Cancer Teaching, Division of Research Grants, National Institutes of Health (1964)
Chairman, Program Committee, Second International Congress of Exfoliative Cytology (1965)
Merit Teaching Award, Ohio State University (1966)
Certificate of Appreciation for "Outstanding Instruction in the Field of Cytology" by the United States Air Force (1966)
Award of Appreciation for First Annual Memorial Lecture, Los Angeles Society of Pathologists (1966)
Papanicolaou Award for Meritorious Achievement in Cytology, American Society of Cytology (1967)
Bronz Award for original investigation, Ohio State Medical Association (1967)
Appointed member of Study Section on Carcinogenesis, National Cancer Institute (1967)

(Dr. von Haam, con't)

Chairman, Program Committee, Third International Congress of Exfoliative Cytology (1968)
Honorable Mention for scientific original investigation exhibit, "Malignant Cells in the Blood Stream" (with Dr. T. D. Stevenson) (1968)
Goldblatt Award for "Outstanding Contribution in the Field of Cytology," International Academy of Cytology (1968)

VI BIOGRAPHICAL DATA

ADAMSON, JOHN B.
B.Sc., Regis College 1950; M.D., Creighton U. 1954; Asst. Prof. 1963-64.

ALLEN, JOHN R.
A.B., Ball State U. 1949; Ph.D., U. of Illinois 1954; Asst. Prof. 1965-68

BABA, NOBUHISA
M.D., U. of Tokyo, Japan 1957; M.Sc., O.S.U. 1961; Ph.D., O.S.U. 1965; Instr. 1963; Asst. Prof. 1966—

BENHAM, WILLIAM H.
B. Pharm., U. City of Toledo 1937; M.D., O.S.U. 1943; Instr. 1948-52; Asst. Prof. 1964—

BISHOP, SANFORD P.
D.V.M., New York State Veterinary College, Cornell U. 1960; M.Sc., O.S.U. 1965; Ph.D., O.S.U. 1968; Asst. Prof. 1968—

BLOODWORTH, J. M. BARTOW, JR.
M.D., Emory U. 1948; Instr. 1951; Asst. Prof. 1956; Assoc. Prof. 1958; Prof. 1960-62

BOWMAN, BERNARD U., JR. See Department of Medical Microbiology
B.S., Piedmont Coll. 1950; M.S., Emory U. 1957; Ph.D., U. of Oklahoma 1963; Asst. Prof. 1964-66

BUERGER, LEOPOLD F.
M.D., Free U. of West Berlin 1955; Instr. 1960; Asst. Prof. 1963-65.

CAMPANA, HERMAN A.
B.S., Santiago Inst. of Science, Cuba 1942; M.D., Havana U., Cuba 1950; Asst. Prof. 1960-66

CEELEN, GUENTHER H.
M.D., U. of Strasbourg, Alsace 1944; Instr. 1953; Asst. Prof. 1959—

COLE, CLARENCE R. See Department of Veterinary Pathology
D.V.M., O.S.U. 1943; M.S., O.S.U. 1944; Ph.D., O.S.U. 1947; Assoc. Prof. 1951; Prof. 1958-67; Dean, College of Veterinary Medicine 1967—

CUPPAGE, FRANCIS E.
B.S., Western Reserve U. 1954; M.Sc., O.S.U. 1959; M.D., O.S.U. 1959; Asst. Prof. 1965-67

DAVIDSON, HORACE B., SR.
M.D., O.S.U. 1933; Instr. 1932; Asst. Prof. 1934; Prof. 1950—

DAVIDSON, HORACE B., JR.
B.A., O.S.U. 1957; M.D., O.S.U. 1960; Asst. Prof. 1967—

DAVIS, MEL A.
B.A., O.S.U. 1921; M.D., O.S.U. 1934; Instr. 1948; Asst. Prof. 1957—

DIEDRICHS, HENRY A.
M.D., U. of Maryland 1955; Asst. Prof. 1965—

DODD, MATHEW C. See Department of Microbiology
A.B., O.S.U. 1933; Ph.D., U. of Michigan 1942; Prof. 1964-66

FERRARO, DOUGLAS T.
B.S., Providence Coll. 1939; M.D., Tufts Medical School 1943; Asst. Prof. 1966-67

FRAJOLA, WALTER J.
B.S., Hamline U. 1938; M.S., U. of Illinois 1947; Ph.D., U. of Illinois 1950; Prof. 1960-68.

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